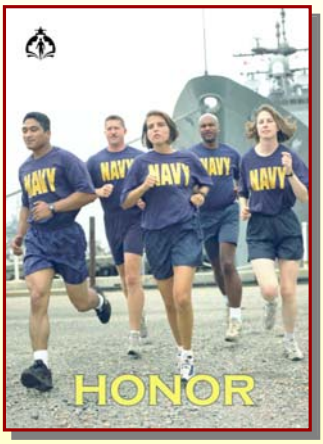
Exercise Program Design

U.S. Navy
Command Fitness Leader Course

Optimizing operational readiness through the advancement of physical fitness of Sailors



Welcome Everyone

Introduce the Presentation

Presentation Objectives

- Understand the importance of **SMART** goal setting
- Identify industry guidelines for exercise program design
- Summarize key physical fitness training principles
- Understand how to overcome exercise program plateaus
- Identify resources available to **C**ommand **F**itness **L**eader**s**

This presentation on Exercise Program Design will provide you with the following learning objectives:

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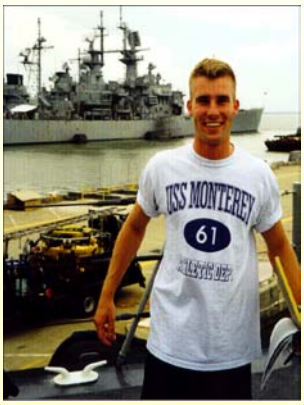
Effective Goal Setting

S.M.A.R.T. Principle

- **S**pecific
- **M**easurable
- **A**ttainable
- **R**elevant
- **T**ime bound



Example: I will lose 5lbs. In 6 weeks by reducing my caloric intake by 300 calories and walking or running 5 days per week for 60 minutes to burn at least 300 calories each session.

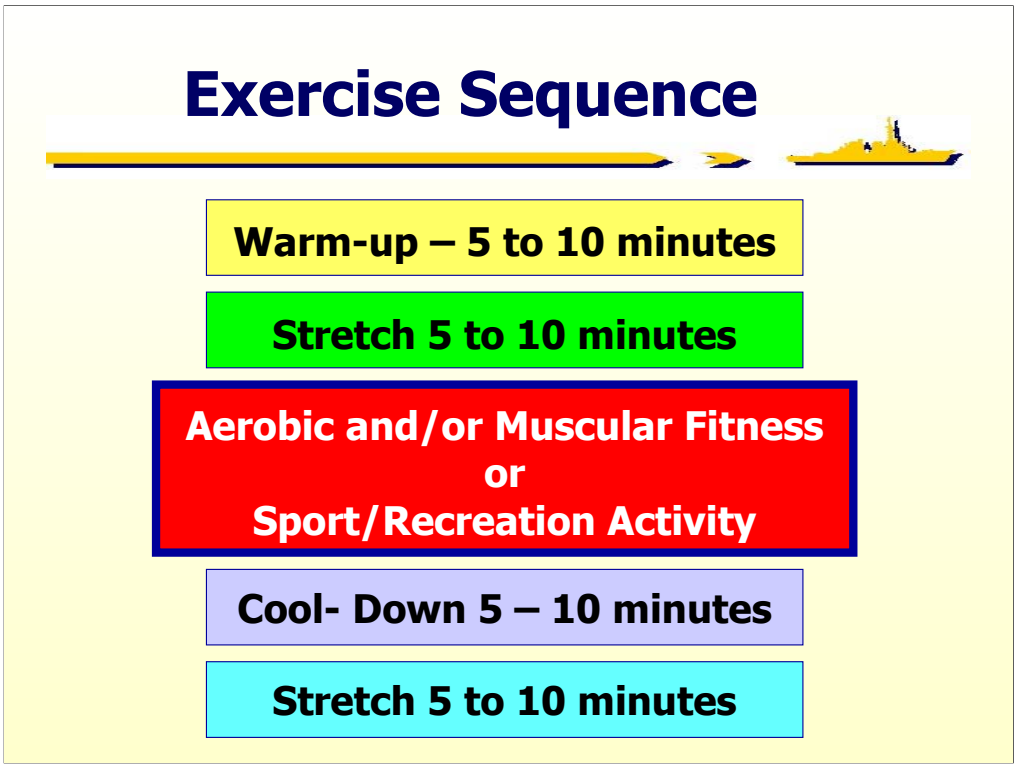
It is important that Sailors use SMART goal setting guidelines when designing or beginning an exercise program or when establishing new personal exercise goals.

The 5 SMART goal setting guidelines listed on the slide are critical for establishing realistic, attainable, and achievable goals.

EXAMPLE:

Instead of saying, "I will lose weight."

A SMART goal setting example would be the example written on the slide: (Read the bottom part of the slide)



There are 5 primary areas included in a workout format.

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The first is warm up. Individuals should warm up at least 5 to 10 minutes before working out.

Press Enter

The next step is stretching for 5 to 10 minutes. It's especially important to stretch the muscles that will be primarily utilized during the workout session. If running, then make sure to stretch the lower body. If strength training upper body, make sure to stretch the upper body before the muscular fitness training session.

Press Enter

Next comes the primary component of the exercise session which may include aerobic and/or muscular fitness training. In addition, this exercise session may also include sport or recreation activities.

Press Enter

After exercising, it is important to cool down especially, if an individual has just completed an aerobic conditioning session. The heart rate needs to gradually recover within 10 beats to the heart rate range experienced prior to exercising. Cooling down prevents dizziness and places less stress on the heart.

Press Enter

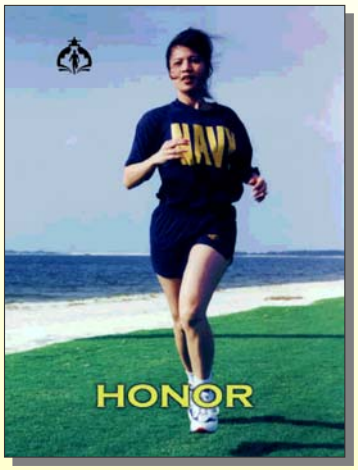
The last step is stretching. Studies have shown that exercisers can achieve better outcomes from stretching when participating in a good stretching routing after physical activity participation.

Industry Recommendations

F.I.T.T. Principle

- **F**requency
- **I**ntensity
- **T**ime
- **T**ype

(ACSM 2000)



The fitness industry uses an acronym called the F.I.T.T. principle to describe the primary components of an exercise program:

F stands for **Frequency** of exercise…… how often should you exercise?

I stands for **Intensity** of exercise….. How hard should you exercise?

T stands for **Time** of exercise….. How long should you exercise?

The last **T** in the **F.I.T.T.** principle stands for **Type** of exercise performed.

Now, let's take a closer look at the 3 primary components of fitness.

Can anyone tell me what the 3 primary components of fitness include?

1. *Aerobic (cardiovascular fitness)*
2. *Muscular fitness*
3. *Flexibility*

Aerobic Conditioning

- **Frequency:** 3 – 5x per week (daily)
- **Intensity:** 60 –85% of HR max
- **Time:** 20 – 60 minutes
- **Type:** Continuous rhythmic movement of large muscle groups

Aerobic activities are those that use large muscle groups, such as your legs, hips and shoulders, at an intensity that can be sustained for a long period of time. The body is able to provide enough oxygen and energy for the muscles to continue functioning effectively. Examples include brisk walking, swimming, hiking, running, stair climbing, aerobic dance, rowing, and bicycling.

To make exercise simpler, let's boil things down to the **F.I.T.T.** principle:

F for frequency, **I** for Intensity, and **T** for time and **T**ype of exercise.

For **Frequency**, Sailors should set a goal to exercise at a vigorous level at least three days a week, or at a moderate level almost every day.

Intensity can be measured by how hard your heart is working. In upcoming slides, I'll discuss methods for measuring your heart rate while exercising.

For **Time**, the American College of Sports Medicine recommends 20 – 60 minutes of continuous aerobic activity. If you haven't exercised in a while, multiple sessions of short duration may be necessary. As you become more conditioned, you can increase the length of time of your workout.

Estimating Target Heart Range

220- age x desired intensity (60 – 85%)

Base number	220
Subtract your age	-30
Maximum heart rate	190
Maximum times 60% (190 x .60)	114
Maximum times 85% (190 x .85)	162

Target Heart Rate Zone for 30-Year-Old
114-162

Let's look closer at how to measure exercise intensity.

Here's a formula to determine your target heart rate zone, which is where you want your heart rate to be during exercise.

To begin, subtract your age from 220.

For example, if you are 30 years old, your working number will be 190.

Now, multiply that number times 60 percent to get the lower range of your target heart rate zone. In this case, the lower range is 114.

To get the upper range, multiply your working number times 85%. For a 30 year old, the upper limit would be 162. Using this formula, we know that a 30 year old would want his or her heart rate to between 114 – 162 beats per minute while exercising.

For safety reasons, the heart rate should not exceed an intensity 90%.

Estimating Target Heart Range

20 Years Old	120 - 170
25 Years Old	117 - 166
30 Years Old	114 - 162
35 Years Old	111 - 157
40 Years Old	108 - 153
45 Years Old	105 - 149
50 Years Old	102 - 145
55 Years Old	99 - 140

Here is a chart that shows target heart rate zones for some selected ages.

If you are trying to improve fitness or performance, you will want to work out at the higher end of the range.

The activity to reach the target zone will be less intense for a less physically fit person than for one who is in good shape. Brisk walking can quickly move the heart rate of an unconditioned adult into his or her target heart rate zone. A more conditioned person would need to exercise at a more intense level to move his or her heart rate to the zone.

Note: In the RESOURCES section of the manual, there is a calculated target heart rate table for all ages.

Monitoring Exercise Intensity

- **10 second count**
- Rating of Perceived Exertion / Borg Scale
- Developed by Borg, provides standard means for evaluating a participant's perception of their physical exertion. The original scale was 6 – 20; revised scale is 0 – 10.

Most of you have probably checked your heart rate by checking your pulse at your wrist or at the carotid artery in the front of your neck. During exercise, your pulse becomes easier to find because the heart is beating harder.

Immediately after the most intense time of your activity, find your pulse by gently but firmly pressing on your wrist near the base of the thumb or on one side of your neck. Don't press too hard, or you may get an inaccurate count by interfering with the rhythm. Count the number of beats in 10 seconds, then multiply that number by six to determine how many beats per minute your heart is beating.

The 30 year old in the earlier example would want a 10 second count between 19-29. A little trick to help make the counting easier is to count zero-zero-zero until the second hand or digital count on your watch reaches a starting number, such as 5, 10, 15, etc; then begin counting your heart beats for 10 seconds.

CLASS ACTIVITY: Everyone in the class determine their THR and check pulse.

NOTE: In the RESOURCES section of your information, a perceived exertion scale is available for your use. It measures the exercise participant's perception of exercise intensity.

Monitoring Exercise Intensity

Talk Test

- Subjective method for measuring exercise intensity using observation of respiration effort and the ability to talk while exercising.

A more subjective method for measuring exercise intensity is that you should be able to talk but not sing during an aerobic activity.

Observation of respiration effort is another subjective method for measuring exercise intensity.

Muscular Fitness

- **Frequency:** 2 – 3 times per week.
  (minimum; daily better)
- **Intensity:** perform set to volitional fatigue
- **Time:** Minimum one set of 8 –12 repetitions
- **Type:** Minimum 8 – 10 exercises for major muscle groups.
- **Tip:** Rest each muscle group 48 – 72 hours

The next primary component of fitness is MUSCULAR fitness

The information on the slide outlines the general F.I.T.T. principle guidelines for muscular fitness.

Muscular strength refers to the amount of force a muscle or muscle group can exert against a resistance in one maximum contraction, through a full range of motion.

Muscular endurance, which is related to strength, is the ability of a muscle or muscle group to apply force repeatedly or to sustain a contraction for a period of time without undue fatigue.

Both are important for many reasons, including improved ability to perform everyday tasks, prevention of low back pain and muscle injuries, enhanced personal appearance, maintenance of good posture, increased bone mass, and for some people, improved sports performance.

Repetitions and Sets

- **Repetition—**
  The Completion of a Movement Through a Full Range of Motion
- **Set—**
  The Number of Reps Attempted Without Rest

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Flexibility Training

- **Frequency:** 2 – 3 days per week (minimum; daily better)
- **Intensity:** To position of mild discomfort

- **Time:** 10 – 30 seconds (static stretch)
- **Type:** General stretching routine for major muscle groups (See 4x5" Navy Fitness Planner Booklet)

Flexibility is the third primary component of fitness.

Listed on the slide is the FITT Principle as it relates to flexibility.

Flexibility, like muscular strength, is specific. Choose your stretches to target the muscle groups that need attention. Muscles that are tight and tense most need to be stretched. For a guide of 10 exercises that stretch the primary muscle groups, see the RESOURCES section of your booklet. Stretches are listed in the flexibility exercise log sheet and the US Navy Exercise Planner Booklet. In addition, a description of each stretch and a list of contraindicated stretches are listed in the Navy Environmental Health Center Fitness Training Kits also found in the RESOURCES section of your CFL training guide.

Key Training Principles

Overload

- Making the body's system you are training work harder than it is accustomed to working

Balance / Opposing Muscle Groups

- Example: Rear flys (back) followed by chest flys
  Biceps curls followed by triceps extensions

People use many different techniques to develop muscular fitness, including free weights, weight machines, and body weight with activities like curlups, pushups and pullups.

Regardless of the techniques you choose, improvement will only result after overloading the muscle in a progressive manner. Overload can be achieved by any combination of the following:

Increase the amount of weight lifted;

Increase the number of sets; and

Decrease the rest time between sets.

The exercises you choose will depend on the muscle groups you choose to develop. Be careful to include the muscles that oppose the ones you have targeted. Muscles are usually grouped in sets that oppose one another. To maintain balance and symmetry, when muscles on one side of the joint are trained, then the muscle group that opposes it should also be exercised.

Key Training Principles cont.

Specificity Training (Action, Speed, Intensity)

- Training effects from an exercise program are specific to the exercise performed and muscles involved.

Interval Training

- Alternating high intensity w/h low intensity exercises.
- Predominately used in cardiovascular training.

The type of exercise chosen is related to the principle of specificity of training. Optimum physical fitness is often defined as the condition resulting from a lifestyle that leads to the development of an optimal level of aerobic fitness, muscular strength and flexibility, as well as the achievement and maintenance of ideal body weight. Because training is specific as described above, an individual must participate in aerobic, muscular, and flexibility exercise to achieve optimum physical fitness.

In addition, if you are training for a specific event, such as the PRT, it is important to train the muscle groups SPECIFIC to that event.

To train for the PRT, for example, it is important to run and to condition the lower extremity muscle groups…. And to actually RUN. Although aerobic gains can be achieved by participating in other various aerobic activities, the body conditions specifically to the demands placed on it. **Another example:** To strengthen the quadriceps area, it is better to perform a quadriceps extension rather than a triceps extension.

Interval training is a method of training that is becoming increasingly popular.

Short, high intensity exercise periods alternated with periods of rest. It is generally used during aerobic conditioning.

Proper Exercise Selection

Available Equipment

- Environment/Surroundings

Risk v/s Benefit

** Limitation identified within the deployed DoN community.*

One factor that will greatly affect the type of exercise you select to perform is the availability of equipment and the surroundings where you are exercising.

The Navy Fitness program provides a wide assortment of various indoor and outdoor exercise equipment selections. Currently the Navy's large ships are equipped with a comprehensive assortment of aerobic, muscular, and flexibility exercise equipment. There are limitations, however, for exercise selection in some of the Navy's smaller ships, including the submarines and small assault craft. Obtaining optimal fitness is still achievable on these small ships. The concepts for designing training routines in confined spaces is the same as any gym-based routine. The level of creativity for exercise selection may be increased. The upcoming presentation on confined spaces training will specifically address this topic.

Regarding **risk v/s benefit** of exercise selection, safety should always preceed effectiveness of the exercise. For example, you may achieve a better range of motion doing a free weight bench press, but without a spotter, it would be safer to perform the machine bench press.

Proper Exercise Selection cont.

Exercise Effectiveness

- Exercise sequence
- Complete Range of Motion
- Momentum – speed of ROM
  (+2 concentric -4 eccentric)

The sequence of your exercises is very important. Work out the largest muscle groups first and avoid working out the same muscle groups back to back. When working your upper body, begin with the large muscles, such as the chest and back. Then move to the smaller upper body muscles, such as the biceps and triceps. For example, if you worked the wrists first, they may be too fatigued to allow you to grip and control weights safely when working larger muscle groups.

Remember to use a full range of motion when performing a flexibility or strength exercise.

During muscular fitness training, perform each lift slowly and steadily. Be in control at all times, especially during the lowering phase. The National Athletic Trainers' Association recommends that your lifting motion take about two seconds and your lowering motion take about twice as long.

Progression

Adaptation / Plateaus (Strength)

- Change training exercises
- Vary number of sets performed
- Change the resistance/repetitions relationship
- Reduce training frequency

If you have reached a strength training plateau ------I.e., you're not noticing any gains in improvement , listed are a few simple changes you can incorporate to assist in overcoming plateaus.

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Strength Plateaus cont.

- Breakdown training (complete 2-3 post-fatigue reps with a decreased weight)
- Assisted training (complete 2-3 post-fatigue reps with assistance during lifting phase
- Eccentric (negative) training (machine)
- Slow the movement speed

Listed are some other steps you can do to overcome strength plateaus.

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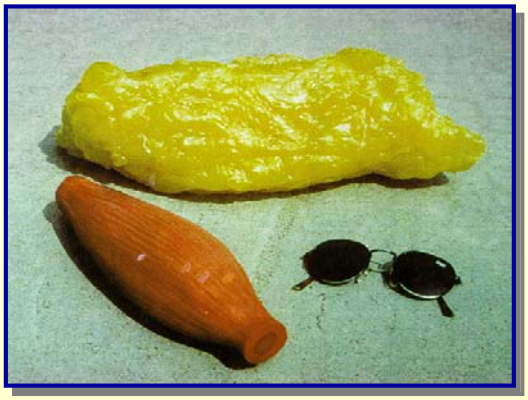
Weight Loss Plateaus

- Increase or decrease training frequency
- Cross train
- Increase or decrease intensity



The key to effective weight management is building more activity in your life and developing healthier eating habits. Both strength training and aerobic exercise can help with weight control, but aerobic activity is more efficient because it involves a sustained high rate of energy expenditure.

If your long term goal is to lose weight, realize that you may not see any weight loss when you begin a strength training program. As your body is burning up fat, it is developing muscle. The good news is that muscle is much more dense. It weighs more than fat but takes up much less space than fat. The slide displayed shows the size difference between 5 pounds of muscle and 5 pounds of fat. This means that you'll probably see a loss in inches before you see a loss in weight.

More good news is that as you develop more muscle mass, your resting metabolic rate will increase. That is the rate at which your body burns up calories when you are at rest. Muscle is active tissue, unlike fat, and burns calories. Therefore, the more muscle mass you have, the more calories you will burn, even while you're sleeping!

Progression

Aerobic / Cardiovascular Phases

- Conditioning (initial) (4-6 weeks or longer)
- Improvement (approx. 8-20 weeks)
- Maintenance (after first 6-12 months of training)

Let's look now at the concept of progression, or moving from one level of activity to the next. For healthy adults, aerobic conditioning usually has three stages: initial, improvement, and maintenance.

The **initial stage** involves light endurance activities for the first four to six weeks of an exercise program. In this stage, you should do low level aerobic activities. Be consistent, but don't overdo it. You may feel a little muscle soreness after your first few days, but you shouldn't be too uncomfortable, and you shouldn't let it stop you from exercising. Continuing to work out can help work the soreness out of the muscles. During the initial stage, try to exercise at least three times a week for 12 to 20 minutes each day.

After four to six weeks you will move into the **improvement stage**. By now, you've noticed improvement in your conditioning. Activity is easier, and you're not breathing as hard during your workout. Over the next four to five months, you should gradually increase your exercise time to 20 to 30 minutes of continuous activity.

The third stage begins somewhere after six months. You've reached a good level of fitness, are feeling pretty good about yourself, and want to maintain what you've got. To do so, be consistent, exercising three to five times a week. If you miss a few days, get back into your program as soon as you can. **A significant reduction in aerobic fitness occurs after tw weeks of inactivity.** If you've missed that much time, start back at a lower intensity than you were working out. The most important thing is that you do start back.

Progression

Muscular Fitness

- Key to strength development is progressive resistance.
- As muscles adapt to a given exercise resistance, it must be gradually increased to stimulate further strength gains.

Regarding Muscular fitness, there are 2 primary concepts to progression

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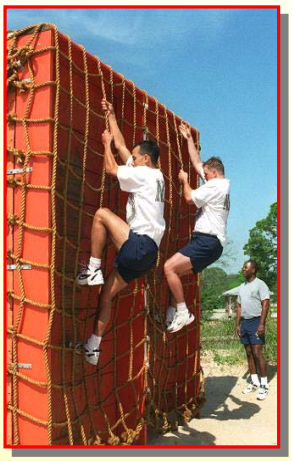
Adherence & Motivation

- Self-motivation
- Type and variety of activities
- Outside support
- Environment
- Realistic expectations /appropriate goals
- Contracts/Agreements
- Visualization

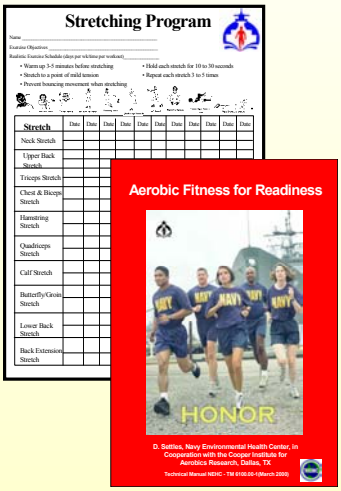


Listed are several elements that will assist you in adhering to your exercise program. These elements will also assist you in continuing maintaining motivation toward exercising.

Speaker note: You can discuss a few of these or provide some personal experiences or examples. You may even ask attendees examples of some of these

Available Resources

- **8 ½ x 11** Educational Handouts
  - Target Heart Rate Sheet
  - Exercise Log Sheets
  - Major Muscles of the Body
- Plan of the Day Notes for Physical Fitness
- Navy Physical Fitness Presentations (MWR & NEHC)
- Navy Exercise Planning Guide



Section 9 in your booklet lists several EXERCISE PROGRAM RESOURCES that are available to you. In addition, a CD of these resources will also be made available to you. Let's review some of these resources……..

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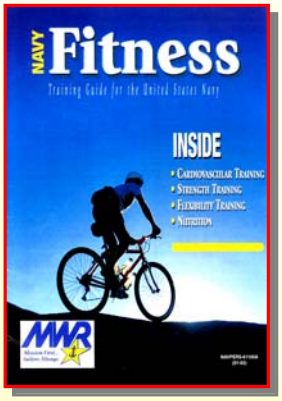
Press enter

Available Resources

- **8 ½ x 11** Educational Handouts
  - Contraindicated Stretches
  - Recommended Stretches
- Navy Peak Performance Manual
- **Ordering information** for:
  - **NEW!** MWR Fitness Training Guide
  - Navy Physical Activity Posters
  - 4"x5" Pocket Navy Exercise Planner
  - Pre-Entry Training Plan
  - Navy Wellness Implementation Manual



Yes, there's more!

Press enter.

What are some of the most common contraindicated exercises? What are 10 recommended stretches for a total body stretching routine? The 81/2 x 11 educational handouts in the resources section will provide you with copies of these stretches.

Press enter.

The Navy's Peak Performance Manual is an excellent resource for both exercise and nutrition.

Press enter.

Some exercise program information can be ordered. Ordering information for these resources is listed in the resources section of your manual.

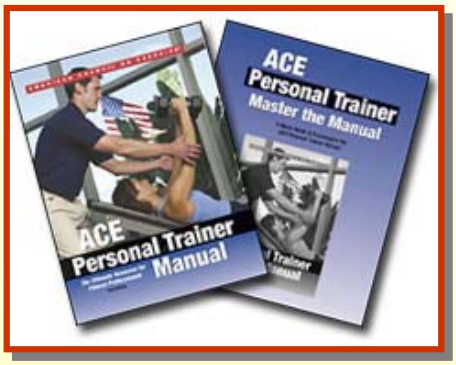
Suggested Reading

American Council on Exercise
Personal Trainer Manual

http://www.acefitness.org

Go to ACE Store

The resource
for fitness professionals!



The presentation I've just presented to you only covers the **elementary basics of exercise program design.** If you are interested in learning more about exercise programming, there are 2 resources that would benefit you.

The first is the latest edition of the American Council on Exercise Personal Trainer Manual. The Personal Trainer Manual: The Resources for Fitness Professionals (3rd Edition) was designed to prepare fitness professionals to work one-on-one or with small groups. Developed and written by 19 of the industry's top expert, the ACE Personal Trainer Manual is an excellent resource, covering everything from anatomy to training techniques.

ACE has also developed a study guide to accompany the ACE Personal Trainer Manual. The study guide will take you through the ACE Personal Trainer Manual chapter by chapter, allowing you to identify weaknesses in knowledge or practical experience and focus your studies.

Speaker Note: If the question arises, cost for both products together is $74.95

Suggested Reading

Fitness Leader's Handbook

By

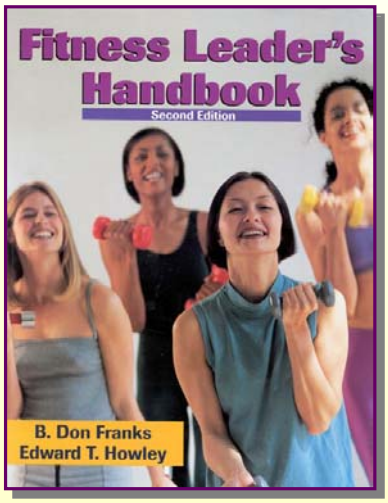
Human Kinetics

ISBN: 0-88011-654-4

To Order:

http://www.humankinetics.com

Or call
1-800-747-4457



Listed is another EXCELLENT resource for exercise programming. The Fitness Leader's Handbook is used often by the American College of Sports Medicine.

It provides a more basic overview of exercise programming. It's an ideal reference for anyone charged with the task of fitness leadership. The book is written for those who haven't had the advantage of formal training. The Fitness Leader's Handbook emphasizes "how to" rather than "why". It's loaded with practical, usable tools and tips that make it easy for even a novice to conduct a successful fitness instruction.

All ordering information is listed on the slide. The cost of the book is $28.00.

Promoting a
Healthy & Fit Force

Conclusion.

Conclusion is at the discretion of the Speaker.

The overall mission of the information is to provide CFL's the basic knowledge to *Optimize operational readiness through the advancement of physical fitness of Sailors.*

Keep up the GREAT work!!!